Insomnia Tendency among Adolescent Smartphone Users: Gender Difference and Prevalence

Anggun Fitriana[1*], Hendro Prabowo[1]

[1] Department of Psychology, Gunadarma University, Depok, Indonesia

Corresponding author email: fitriananggun@gmail.com

Article Info

ABSTRACT

The majority of Indonesian adolescents are smartphone users. Excessive use of smartphones, especially at night, can cause sleep difficulties known as insomnia. The study aims to determine gender difference and prevalence of insomnia tendency, pre-sleep activities, sleep duration, and difficulty sleeping among adolescent smartphone users. The cross-sectional design was used, involved 307 adolescents aged 13–18 years in Jabodetabek, Indonesia. Measures included an ISI questionnaire and information on gender, pre-sleep activities, sleep duration, and difficulty sleeping experience. Results showed that there is a significant difference (p 0,029) in insomnia tendency based on gender (female>male). Insomnia tendency is generally in the mild category with the prevalence of insomnia tendency 22,15% (moderate & severe). Respondents spent an average of 1 hour 22 minutes on the bed, using the internet via smartphone before asleep. Their sleep duration averaged 6,67 hours per night, 72% sleep less than 8 hours, and 51% feel don't get enough sleep. Furthermore, 58% reported difficulty sleeping, 24,43% experienced sleeping difficulties at least three nights per week, and 26,71% experienced sleeping difficulties for at least three months. Insomnia tendency is also generally found to increases with increasing frequency and duration of difficulty sleeping. These findings suggest that the insomnia tendency among adolescent smartphone users in Jabodetabek, Indonesia is high, especially compared with other countries. Therefore, it needs special attention from both academics and practitioners.

ABSTRAK

Mayoritas remaja Indonesia adalah pengguna smartphone. Penggunaan smartphone secara berlebihan, terutama pada malam hari, dapat menyebabkan kesulitan tidur yang disebut dengan insomnia. Penelitian ini bertujuan untuk mengetahui perbedaan gender dan prevalensi kecenderungan insomnia, aktivitas sebelum tidur, durasi tidur, dan kesulitan tidur di kalangan remaja pengguna smartphone. Desain yang digunakan adalah cross-sectional, melibatkan 307 remaja berusia 13–18 tahun di Jabodetabek, Indonesia. Tindakan yang dilakukan meliputi kuesioner ISI dan informasi mengenai gender, aktivitas sebelum tidur, durasi tidur, dan pengalaman kesulitan tidur. Hasil penelitian

menunjukkan terdapat perbedaan yang signifikan (p 0,029) kecenderungan insomnia berdasarkan jenis kelamin (perempuan>laki-laki). Kecenderungan insomnia secara umum berada pada kategori ringan dengan prevalensi kecenderungan insomnia 22,15% (sedang & berat). Responden menghabiskan rata-rata 1 jam 22 menit di tempat tidur, menggunakan internet melalui smartphone sebelum tidur. Durasi tidur mereka rata-rata 6,67 jam per malam, 72% tidur kurang dari 8 jam, dan 51% merasa kurang tidur. Selain itu, 58% melaporkan kesulitan tidur, 24,43% mengalami kesulitan tidur setidaknya tiga malam dalam seminggu, dan 26,71% mengalami kesulitan tidur setidaknya selama tiga bulan. Kecenderungan insomnia juga umumnya ditemukan meningkat seiring dengan meningkatnya frekuensi dan durasi kesulitan tidur. Temuan ini menunjukkan bahwa kecenderungan insomnia pada remaja pengguna ponsel pintar di Jabodetabek, Indonesia tergolong tinggi, terutama dibandingkan dengan negara lain. Oleh karena itu, perlu perhatian khusus baik dari kalangan akademisi maupun praktisi.

INTRODUCTION

Adolescence is a transformative period characterized by profound intellectual, physiological, psychological, and social changes (Donskoy & Loghmanee, 2018). For adolescents who're going through rapid growth and development (Dahl, Allen, Wilbrecht, & Suleiman, 2018), sleep is necessary and particularly important for their physical and mental health (Owen & Weiss, 2017; Hosker, Elkins, & Potter, 2019). According to the National Sleep Foundation, the ideal sleep duration recommended is 9–11 hours for children (6–13 yo), 8–10 hours for adolescents (14–17 yo), and 7–9 hours for young adults (18–25 yo) (Hirshkowitz et al., 2015). However, not all adolescents get sufficient sleep. Some of them even have difficulty sleeping.

One of the factors contributing to insufficient dan difficulty sleeping in adolescents is the use of technology/electronic media, including smartphones (Owens, 2014). The National Sleep Foundation found a significant association between the use of technology in bed and sleep health. It reported that 48% of Americans use technology/gadgets like a computer, tablet, or smartphone in bed before sleep. They showed a lower sleep quality than those who did not use technology in bed (Roy, 2017). Previous studies also reported an association between smartphone use with sleep and insomnia in adolescents (e.g., Tamura, Nishida, Tsuji, & Sakakibara, 2017; Mac-Carthaigh, Griffin, & Perry, 2020).

It is a concern, especially for Indonesia which the majority of the population is internet and smartphone users, including adolescents. The Kominfo Survey in 2017 reported that the prevalence of smartphone users in the population aged 9-19 years reached 65.34%, particularly in junior high school students was 59.89% and in high school students was 79.56% (Syaifullah, 2018). Another survey from APJII in 2018 reported that 64.8% of Indonesia's population is internet users, while 93.9% of them access the internet via smartphones (APJII, 2019). With the high number of smartphone users in Indonesian adolescents, their smartphone use behavior

needs to be paid more attention to, especially regarding its impact on difficulty sleeping which is known as insomnia.

According to DSM-5, insomnia disorder, or commonly referred to as insomnia, is a sleep-wake disorder in which a person experiences dissatisfaction with their quantity or quality of sleep, including difficulty in initiating sleep, maintaining sleep, or/and early-morning awakening with inability to return to sleep (American Psychiatric Association, 2013). Based on frequency, the sleep difficulty needs to occur at least three nights/week and for at least three months, despite the sufficient opportunity to sleep (American Psychiatric Association, 2013; Taylor, Gehrman, Dautovich, Lichstein, & McCrae, 2014). The severity of insomnia also can be qualified based on intensity; (1) threshold between normal/ abnormal sleep is 30 or more minutes to fall asleep or/and to truly awake after sleep; (2) regular sleep duration is 6-6,5 h per night or less (Attarian & Perlis, 2010).

Insomnia is common in adolescents, especially in females and late adolescents (de Zambotti, Goldstone, Colrain, & Baker, 2018). Previous studies investigated gender differences in adolescent's insomnia and revealed that females are more likely to have insomnia than males (e.g., Lange et al., 2015; Abdel-Khalek, 2017; de Zambotti, Goldstone, Colrain, & Baker, 2018). As for the prevalence of adolescent's insomnia, estimates vary, it ranges from 4% to 39%, depending on methodology (classification of insomnia used) and country sampled (Chung, Kan, & Yeung, 2011; de Zambotti, Goldstone, Colrain, & Baker, 2018; Prasetyo, Soemarko, & Kusumadewi, 2018). In Indonesia, there have been studies on the prevalence of insomnia in the general population (e.g., Salbiah, 2018) and in adults (e.g., Peltzer & Pengpid, 2019). However, the information related to the prevalence of insomnia among adolescents is still lacking in Indonesia, even in Southeast Asia (Peltzer & Pengpid, 2019).

It is important to note that most studies on sleep disorders have been conducted on Western and East Asian populations (Abdel-Khalek, 2017, p. 172). Studies related to gender differences and the prevalence of insomnia among adolescents in Indonesia are still limited, particularly adolescent smartphone users. This research fills this gap by investigating gender differences and the insomnia tendency's prevalence among adolescent smartphone users in Jabodetabek, Indonesia. Authors hypothesized that there is a gender difference in insomnia tendency, in which female adolescents will report higher insomnia tendency than male adolescents. Other topics covered in this research include pre-sleep activities, sleep duration, frequency, and duration of difficulty sleeping.

METHODS

This research was an epidemiology study (analytic and descriptive) with a cross-sectional design. Analytic-epidemiological research was conducted by comparing groups of males and females to test the hypothesis of gender differences in insomnia tendency among adolescent smartphone users. Meanwhile, descriptive-epidemiological research was conducted to estimate the insomnia tendency's prevalence and investigate the pre-sleep activities, sleep duration, frequency of difficulty sleeping, and duration of difficulty sleeping among adolescent smartphone users in Jabodetabek, Indonesia. The present research was approved by the relevant institutional review boards.

Participants & Sampling Procedures

The population in this study were adolescent smartphone users in Jabodetabek, Indonesia. A non-probability sampling with the purposive technique was used to select adolescents smartphone users aged 13–18 years and from Jabodetabek, Indonesia. The age criteria were selected based on Hurlock's age range for adolescents, namely 13–18 years, which is the age of adolescents at the educational stage from grade 7 (junior high school) to grade 12 (high school/vocational high school) in Indonesia (Gandhi, 2006). In the end, 307 respondents were obtained as a research sample, comprising 109 males (35,5%) and 198 females (64,5%).

Materials & Apparatus

The questionnaire for data collection contains Insomnia Severity Index (ISI) to measure insomnia tendency in this study. The ISI consists of 16 items was adapted by Nadia (2019) from Morin and Espie (2004). The Likert scale was used to respond to each statement on the ISI items related to the condition of respondents, with the criteria score of 1–5 (not severe–very severe).

A content validity test was carried out, consisting of logic and face validity (Noor, 2011). In the logic validity, which is done by expert judgment, the diction of ISI items was chosen in such a way as to fit the context and can be understood by adolescents. In the face validity, item wording was carried out by four representatives of respondents (2 females & 2 males).

In addition, an item discrimination power test was conducted using the corrected item-total correlation. According to Azwar (2016), item discrimination power is considered good if the item-total correlation coefficient reaches a minimum of 0,30 while a negative correlation coefficient is unacceptable. The results showed that the item-total correlation of 16 items ranges from 0,402 to 0,727, which means that all ISI items have good item discrimination power.

A reliability test was also carried out using Cronbach's alpha coefficient. Cronbach's alpha coefficient in the range of 0,70 (> 0,70) is acceptable and above 0,80 (> 0,80) is good (Sekaran in Suryani & Hendriyadi, 2015). The results show that the Cronbach Alpha reliability coefficient is 0,912, which means that the ISI used is considered reliable to measure the insomnia tendency in this study. Apart from the ISI, other questions covered in the questionnaire include the information of gender, sleep duration, difficulty sleeping, and pre-sleep activities.

Procedures

Data collection was carried out in two ways: (1) distributed the questionnaire in the form of "paper and pencil test" to respondents who met the criteria and (2) spread out the questionnaire using Google Form through links, broadcast, or flyers which were shared in a variety of online social media. The data was collected from 5 February to 12 February 2020. Researchers obtained 356 respondent data consisting of 235 google form data and 121 paper and pencil test data. Then, data screening was carried out to check the completeness of identity data, scale answers, and the fulfillment of the respondent's criteria. After the screening, 307 respondents were selected, consisting of 210 google form data and 97 paper and pencil test data (198 women and 109 men). Then, the data was processed and analyzed.

Data Analysis

In the study, the categorization and prevalence of insomnia tendencies were analyzed using data from the ISI. The higher the ISI score, the higher the insomnia tendency level. According to Morin and Espie (2004), the ISI scale scores can be grouped into four categories; Normal, mild, moderate, and severe. The total score is obtained by summing up the highest scores on each item (5×16=80), while the range of scores for each category is obtained by dividing the total score by

the number of categories (80÷4=16). Therefore, the ISI scores in this study were grouped into four categories; Normal (16–31), mild (32–47), moderate (48–63), and severe (64–80).

The prevalence of insomnia tendency was determined by adopting the ISI cut score method from Gagnon, Belanger, Ivers, and Morin (2013), namely the detection of clinical insomnia, which was carried out by the cut score in the moderate and severe categories. Thus, the prevalence of insomnia tendency in this study was determined by ISI score >48. Furthermore, to test the hypothesis in this study regarding gender differences in insomnia tendency, the data were analyzed using an independent sample t-test. If the t-test significance is lower than 0,05 (p <0,05), then there is a significant difference, and vice versa (Nisfiannoor, 2009). Meanwhile, the rest of the measurements were carried out using descriptive statistics. These tests were carried out with the help of the IBM SPSS Statistics version 25 program.

RESULTS AND DISCUSSION

In table 1, there's descriptive statistical data related to respondent characteristics, pre-sleep activities, sleep duration, frequency of difficulty sleeping, and duration of difficulty sleeping. Respondents spent an average of 1 hour 22 minutes, and 30 minutes in the majority, on the bed before sleep. Bedtime activities that are frequently performed, including (1) access the internet via smartphones; (2) using a smartphone without internet access; (3) watching TV; (4) access the internet via other gadgets; (5) read novels, books, and comics; (6) using other gadgets without internet access; and (7) study.

Their sleep duration mostly ranged 6–7 hours per night (averaged 6,67 hours). About 72% of respondents slept less than 8 hours, and 51% felt they were not getting adequate sleep times. Further, 58% reported difficulty sleeping, 24,43% have difficulty sleeping at least three nights per week, and 26,71% have difficulty sleeping for at least three months.

Table 1. Descriptive Statistics

		N	%			N	%
Domicile	Jakarta	19	6,19%	Time in bed	< 30 minutes	44	14,33%
	Bogor	115	37,46%	before sleep	≥ 30 minutes	263	85,67%
	Depok	158	51,47%				
	Tanggerang	6	1,95%	Bedtime	Acces internet	176	57,33%
	Bekasi	9	2,93%	activities	via smartphone		
					Using	91	29,64%
Gender	Male	109	35,50%		smartphone		
	Female	198	64,50%		without internet		
					Watching TV	48	15,63%
Age	13	5	1,63%		Acces internet	13	4,23%
	14	25	8,14%		via other gadget		
	15	89	28,99%		Read novels,	10	3,26%
	16	81	26,38%		books, comics		
	17	54	17,59%		Using other	4	1,08%
	18	53	17,26%		gadget without		
					internet		
Education	7th grade	4	1,30%		Study	3	0,98%
	8th grade	4	1,30%				
	9th grade	47	15,31%	Difficulty	Yes	129	42,02%
	10th grade	135	43,97%	sleeping	No	178	57,98%
	11th grade	23	7,49%				
	12th grade	94	30,62%	Frequency	Not having	178	57,98%

				of difficulty sleeping	difficulty sleeping		
Sleep adequacy	Adequate	150	49%				
	Not Adequate	157	51%		< 3 nights/week	54	17,59%
					≥ 3 nights/week	75	24,43%
Sleep duration	2–3 hours	5	1,63%	Duration of difficulty sleeping	Not having difficulty sleeping	178	57,98%
	4–5 hours	58	18,89%				
	6–7 hours	158	51,47%				
	8–9 hours	78	25,41%		< 3 months	47	15,31%
	≥ 10 hours	8	2,61%		≥ 3 months	82	26,71%

Categorization & Prevalence of Insomnia Tendency

From the ISI data analysis based on Morin and Espie (2004) as well as Gagnon, Belanger, Ivers, and Morin (2013), the results of the categorization and prevalence of tendency insomnia are shown in table 2. The table shows that Insomnia tendency on average is in the mild category with a mean empiric (ME) of 39,69 while the prevalence of insomnia tendency is 22,15% (20,85% moderate & 1,30% severe).

Table 2. Categorization and Prevalence of Insomnia Tendency

	Average Category		Prevalence per category			
	ME	Category	Normal	Mild	Moderate	Severe
Insomnia	39,69	Mild	28,66%	49,19%	20,85%	1,30%

Gender Difference in Insomnia Tendency

Hypothesis: There is a gender difference in insomnia tendency, in which female adolescents will report higher insomnia tendency than male adolescents. The hypothesis was tested using independent sample t-test. The result showed in table 3.

Table 3. Summary Results of the Gender Difference in Insomnia Tendency among Adolescents Smartphone User

	Gender	N	ME	Std. Deviation	Df	t	p
Insomnia	Male	109	37,77	11,822	305	-2,190	0,029 (<0,05)
	Female	198	40,75	11,156			

Table 3 shows that the t-test significance is 0,029 (p <0,05), which means a significant difference in the average level of insomnia tendency based on gender. Furthermore, the insomnia tendency in male adolescents showed a mean empiric (ME) of 3,77, while for female adolescents, it was 40,75. The data indicates that the insomnia tendency was higher in female adolescents than in male adolescents. Thus, the hypothesis in this study is accepted, namely that there is a gender difference in insomnia tendency among adolescent smartphone users, in which female adolescents report higher insomnia tendencies than male adolescents.

Categorization and Prevalence of Insomnia Tendency based on Gender Difference, Frequency, and Duration of Difficulty Sleep

Table 4 shows that generally, the respondent's insomnia tendency was in the mild category. However, there are differences in the empirical mean (ME) and prevalence based on gender, frequency of difficulty sleeping, and duration of difficulty sleeping. Based on gender, it appears that female adolescents show a higher empirical mean and prevalence of insomnia tendency (ME: 40,75, prevalence 23,74%) than male adolescents (ME: 37,77, prevalence 19,27%). It shows that the insomnia tendency is higher and more prevalent in female adolescents than in male adolescents. Furthermore, the empirical mean and prevalence of insomnia tendency appeared to increase with increasing frequency and duration of sleeplessness.

Table 4. Insomnia Tendency Based on Gender Difference and Difficulty Sleeping

		N	Category		Prevalensi	
			ME	Category	No Insomnia	Insomnia
Gender	Male	109	37,77	Mild	80,73%	19,27%
	Female	198	40,75	Mild	76,26%	23,74%
Frequency of difficulty sleeping	None	178	35,42	Mild	91,01%	8,99%
	< 3 nights/week	54	41,19	Mild	74,07%	25,93%
	≥ 3 nights/week	75	48,76	Moderate	44,93%	50,67%
Duration of difficulty sleeping	None	178	35,42	Mild	91,01%	8,99%
	< 3 months	47	41,11	Mild	76,60%	23,4%
	≥ 3 months	82	48,16	Mild	50,00%	50,00%

The present study aimed to investigate the pre-sleep activities, sleep duration, difficulty sleeping, prevalence, and gender difference in insomnia tendency among adolescent smartphone users in Jabodetabek, Indonesia. The findings of this study revealed alarming outcomes. Respondents reported spending quite a long time on the bed before asleep, regularly accessing the internet via smartphone. Then during sleeping, they mostly spent rather short sleep duration (less than recommended for adolescence). More than half of them felt that they were not getting adequate sleep time. One-fourth of respondents also reported difficulty sleeping frequently. This finding indicates a high chance of insomnia tendency. The result of the ISI questionnaire also reported a high prevalence of insomnia tendency, which increases with increasing frequency and duration of difficulty sleeping. It also needed to take note that females tend to have insomnia tendency rather than males. A breakdown of the results will be discussed further in the following section.

Regarding pre-sleep activities, respondents reported spending an average of 1 hour and 22 minutes, and 30 minutes in the majority (85,67%) on the bed before they fell asleep. It is an alarming result, given that the threshold between normal/abnormal sleep is 30 minutes or more to fall asleep, and it is a determining factor in the severity of insomnia (Attarian & Perlis, 2010). It can be an early sign of abnormal sleep phenomena and an insomnia tendency among Indonesian adolescents. Further investigation on bedtime activities revealed the following result, including (1) access to the internet via smartphone (57,33%); (2) using a smartphone without internet access (29,64%); (3) watching TV (15,63%), (4) access the internet via other gadgets (4,23%); (5) read novels, books, and comics (3,26%); (6) using other gadgets without internet access (1,08%); and (7) study (0,98%). This result showed that most of their bedtime activities were associated with technology/electronic media use (e. g. internet, smartphone, TV, and other gadgets).

According to Owens (2014), technology/electronic media use is one of the factors contributing to insufficient and difficult sleep in adolescents. Related studies by NSF found a significant association between technology using in bed and sleep health. Forty-eight percent of Americans reported using a device in bed (like a computer, tablet, smartphone) before trying to go to sleep. They showed a lower sleep quality than those who did not use technology in bed (Roy, 2017). Previous studies also reported an association between smartphone use with sleep and insomnia in adolescents (e.g., Tamura, Nishida, Tsuji, & Sakakibara, 2017; Mac-Carthaigh, Griffin, & Perry, 2020).

The sign of insomnia tendency among respondents is not only shown by the duration they need to asleep as previously explained. They also reported rather short sleep duration and frequent sleep difficulties. Regarding sleep duration, 72% of respondents reported sleeping less than 8 hours. Considering that the ideal sleep duration recommended by National Sleep Foundation is 8–10 hours for adolescents (Hirshkowitz et al., 2015), therefore the majority of respondent's sleep quantity is not sufficient. Hence, more than half of them (51%) felt they were not getting adequate sleep time. Further, most of their sleep duration ranged from 6–7 hours per night (averaged 6,67 hours). This result is lower than the average sleep duration for adolescents in several countries, such as 7 hours and 2 minutes in Hong Kong (Chung, Kan, & Yeung, 2011), 7,35 hours in Taiwan (Huang, Wang, & Guilleminault, 2010), and 7,3–8,5 hours in The United States (Maslowsky & Ozer, 2014). But, it is higher than South Korea, which is 4.9 hours (Owens, 2014).

As for the sleep difficulty experience, 58% of respondents reported that they experienced difficulty sleeping at night. To be qualified as insomnia, the sleep difficulty symptom needs to occur at least three nights/week and for at least three months, despite the sufficient opportunity to sleep (American Psychiatric Association, 2013; Taylor, Gehrman, Dautovich, Lichstein, & McCrae, 2014). The result of this study revealed that 24,43% of respondents experienced difficulty sleeping at least three nights per week, and 26,71% having difficulty sleeping for at least three months. It indicates that approximately one-fourth of adolescent smartphone users have experienced frequent sleep difficulties in which may lead to insomnia tendency.

With the sign of insomnia tendency shown by a high number of adolescent smartphone users in this study, such as long pre-sleep time duration, short sleep duration, and frequent sleep difficulties, it is more likely for them to have insomnia. The present study revealed that respondent's insomnia tendency is in the mild category on average. The prevalence of insomnia tendency is 22,15% (20,85% moderate & 1,30% severe). This result is higher than other countries, such as 18,5% in the United States (de Zambotti, Goldstone, Colrain, & Baker, 2018), then 13,1% in Portugal (Amaral et al., 2017), and 20,4% in China (Cao et al., 2017). Indeed, related studies from various countries showed that the prevalence of insomnia in adolescents ranges from 4–39% (Chung, Kan, & Yeung, 2011). The result is also higher than the prevalence of insomnia among Indonesian adults (25–34 yo), which is 11,7% (Peltzer & Pengpid, 2019). Therefore, adolescents may tend to have insomnia more than adults in Indonesia. Generally, a previous study revealed that the prevalence of insomnia in Indonesian society is 10% which is the highest prevalence rate compared to other countries in Asia (Salbiah, 2018).

Next, the present study hypothesized that there is a gender difference in insomnia tendency, in which female adolescents will report higher insomnia tendency than male adolescents. This hypothesis is accepted, according to the result of this study. It was reported that the t-test significance is 0,029 (p <0,05). The insomnia tendency in males showed ME of 37,77 while for females 40,75. Also, The prevalence of insomnia tendency was founded higher in females (23,74%) than in males (19,27%). These findings are consistent with the previous studies. A study on adolescents in Detroit found that 10,7% of adolescents experienced insomnia which the prevalence in females was higher (12,4%) than in males (8,9%) (Johnson, Roth, Schultz, & Breslau, 2006). Another study on Arabian adolescents found a significant difference in insomnia by gender difference where females showed a higher average score (14,26) than males (12,76) (Abdel-Khalek, 2017). Further, cross-sectional data analysis of 7533 adolescents from the KiGGS study in Germany found that the prevalence of insomnia in females was higher (7,4%) than in

males (4,2%) (Lange et al., 2015). Sleep Medicine Reviews also reported that insomnia is common among adolescents with a prevalence of 18,5% (23,6% females and 12,5% males (de Zambotti, Goldstone, Colrain, & Baker, 2018).

In addition to the gender difference in insomnia tendency, there are also differences in insomnia tendencies based on frequency and duration of difficulty sleeping. Table 4 shows that the empirical mean (ME) of insomnia tendency appeared to increase with increasing frequency and duration of difficulty sleeping. Thus, it indicates that insomnia tendency increases with the increase of frequency and duration of difficulty sleeping. It noted that to be diagnosed with insomnia, sleep difficulties must occur at least three nights/week and at least three months, despite adequate opportunity for sleep (American Psychiatric Association, 2013; Taylor, Gehrman, Dautovich, Lichstein, & McCrae, 2014). Yet, the present study revealed that the tendency for insomnia started as early as the symptom appeared less frequent than that. This tendency can increase at any time with the increase of frequency & duration of sleep difficulties. Therefore, precautions need to be taken as early as possible when sleeping difficulties begin to emerge.

CONCLUSION

Based on the result of the present study, it can be concluded that the insomnia tendency among adolescent smartphone users in Jabodetabek, Indonesia is high, especially compared with other countries. The findings of this study revealed alarming outcomes, such as the long pre-sleep time duration with the great use of smartphones in bed, short sleep duration, and frequent sleep difficulties. Thus it is more likely for many of them to have insomnia. Therefore, it needs special attention from both academics and practitioners. It also needs to note a difference in insomnia tendency based on gender (females > males). The insomnia tendency increases with the increasing frequency and duration of difficulty sleeping. Thus, it needs to take precautions as early as possible when sleeping difficulties begin to emerge, with the gender difference factor taken into consideration.

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